

Comparison of inj. succinylcholine 0.6 mg/ kg with 1 mg/kg for elective intubation

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Abstract

Aims and Objective: To compare Succinylcholine 0.6 mg/kg with 1 mg/kg for elective intubation regarding duration of fasciculation, intubating conditions and hemodynamic changes. **Study Design:** Prospective, randomized, double blind trail. **Material And Methods:** Total 60 patients of ASA physical states I and II were randomly allocated to two groups of 30 each. After induction of anesthesia, Group C received 1 mg/kg Succinylcholine, Group S received 0.6 mg/kg Succinylcholine. Both the groups were compared on the basis of duration of fasciculations, hemodynamic changes and grade of intubation. **Results:** Duration of fasciculations in Group S was 15.6 ± 11.10 seconds, while that of Group C was 16.5 ± 11.41 seconds, which is not significant statistically ($p > 0.05$). Also hemodynamic changes were comparable in both groups. Though acceptable grade of intubation were same in both groups, Group C was having statistically significant excellent grade of intubation than Group S. **Conclusion:** Though acceptable intubating conditions achieved in both the groups are same, for excellent intubating conditions 1 mg/kg dose is better than 0.6 mg dose. The dose of 0.6 mg/kg is not having any added advantage regarding duration of fasciculations and hemodynamic changes.

Keywords: Succinylcholine, Intubating conditions, Fasciculations, Hemodynamic changes.

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INTRODUCTION

Inj. Succinylcholine is a depolarizing type of muscle relaxant. It is in use for more than last 50 years¹, since then it is known for its rapid onset of action and shorter duration of action, which remains unmatched till now. This makes it a drug of choice for intubation^{2,3}. Inj. Papacurionium, a non depolarizing muscle relaxant was introduced to replace Succinylcholine, but it was voluntarily taken off market because of its cardiac toxicity^{1,4}. Inj. Succinylcholine is also having side effects in the form of increased Intra Ocular Pressure, Intra Abdominal Pressure, muscle fasciculation's^{1,4}, rise in serum potassium levels¹, post op myalgia⁴. Incidence of

myalgia is quoted to be 41-92 %². Other non depolarizing drugs have been studied and compared with Succinylcholine like Rocuronium^{6,7,8}, atracurium³. But none of the drugs is as rapid and short acting as Succinylcholine. The conventional dose of Succinylcholine is considered to be 1 mg/kg^{9,10}. Various doses ranging from 0.3mg/kg to 3 mg/kg have been studied^{4,9,11} to conclude the optimal dose that will produce excellent intubating conditions yet at the cost of minimal side effects. Low dose succinylcholine has also been used for insertion of LMA^{12,13,14}.

MATERIAL AND METHODS

The present study is a prospective, randomized, double blind controlled study. Ethical committee approval was taken from hospital institutional ethical committee, Bharati medical college, sangli. Total 60 patients were included in the study. All the patients were of American society of anesthesiologist (ASA) physical status grade I and II patients, in the age group 18-65 years, requiring general anesthesia and intubation for elective surgery. Exclusion criteria being Emergency operation, Suspected difficult airway, Recent history of burns, neuropathy, myopathy, Open eye injury, Pregnancy and patients with history or documented deficiency of pseudocholine

esterase. Informed written consent was obtained from patient. Patients were divided into two groups of 30 each. Group S (study Group) in which inj. Succinylcholine 0.6 mg/kg was given, and second group, Group C (control group), in which inj. Succinylcholine 1 mg/kg was given. Patients were allocated to particular group by asking them to pick up a sealed envelope stating either of the doses. In Operation Theater, standard monitoring was applied in the form of Electrocardiograph, non invasive blood pressure (NIBP), Pulseoximetry, and baseline pulse, systolic and diastolic blood pressure were recorded. IV line secured with 20 G vein flow. All the patients were premedicated with inj. Glycopyrrolate 0.2 mg, inj. Midazolam 0.03 mg/kg, inj. Pentazocine 0.3 mg/kg, inj. Ranitidine 50 mg, inj. Ondansetron 4 mg IV. Patients were preoxygenated with 100% oxygen for five minutes. Anesthesia was induced with inj. Propofol 2 mg/kg. After confirming the ability to ventilate, patients from study group were paralyzed with designated dose of depending on the particular group. Intubation was attempted after 60 seconds of inj Succinylcholine by the anesthesiologist having more than two year experience. Intubating anesthesiologist was blinded of the dose of the drug, and he graded the intubating conditions. Intubating conditions were graded according to Copenhagen Consensus Conference (CCC) Score¹⁵.

Table 1

Laryngoscopy		Easy	Fair	Difficult
Vocal Cords	Position	Abducted	Intermediate	Closed
	Movement	None	Moving	Closing
Reaction to intubation	Limbs	None	Slight	Vigorous
	Coughing	None	Diaphragm	>10 s
		Excellent	Good	Poor

Excellent: All Excellent, **Good:** All are either excellent or good, none is poor, **Acceptable:** All Excellent or Good. **Poor:** One or more Poor.

Onset of fasciculations was recorded when the facial twitching is started and End of fasciculations was recorded at end of the twitching at toes. Total duration of fasciculations was recorded. In case, if the intubation was unsuccessful, 1 patient was given inj. Rocuronium and intubation was done after 1 minute. After giving inj. Succinylcholine, Heart rate, systolic blood pressure,

diastolic blood pressure observed at each one minute interval up to five minutes.

RESULTS

Demographic Data

Patients from both the groups are having comparable characteristics regarding the demographic data.

Table 2

Character	Study group (mean \pm SD)	Control group (mean \pm SD)
Age (years)	38.26 \pm 11.60	38.23 \pm 12.57
Weight (kg)	56.36 \pm 10.31	58.53 \pm 10.92
Sex Male	16	17
Females	14	13

Duration of fasciculations

Duration of fasciculation in the study group is 15.6 \pm 11.10 second, while that of control group it is 16.5 \pm 10.67 second. With p value of 0.75, the difference in both groups is not statistically significant.

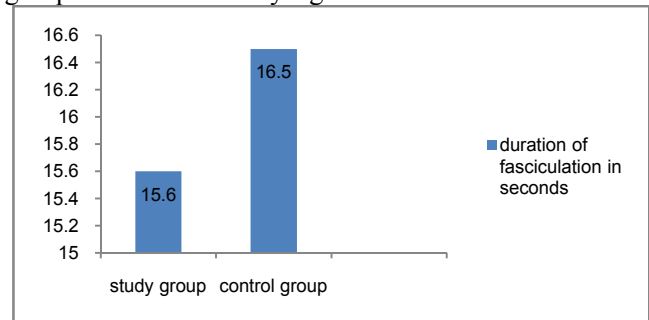


Figure 1: Duration of fasciculations in second

Hemodynamic Changes

Preoperative systolic blood pressure recordings in both groups are comparable. Systolic blood pressure changes in study group and in control group are not statistically significant. Changes in the diastolic blood pressure in study group and control group are statistically not significant, also heart rate changes in both the groups are also non significant. Line diagram below shows the changes in heart rate, systolic and diastolic blood pressure preoperatively and up to 5 minutes thereafter, and from p value it can be noted that the changes in the hemodynamic parameters are also statistically not significant in both the groups.

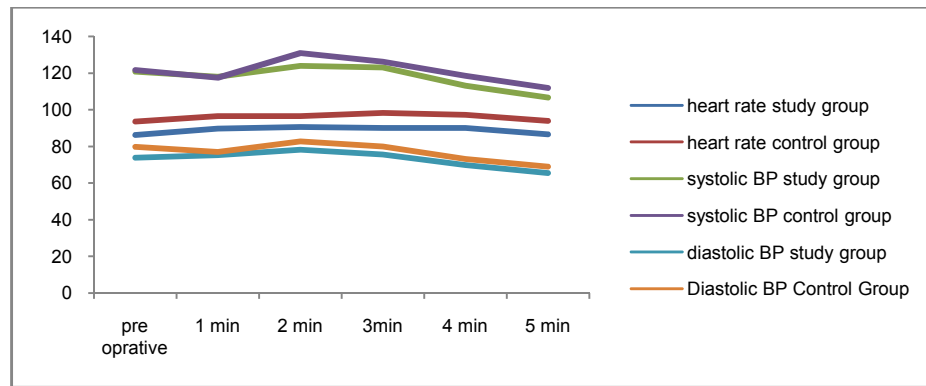


Figure 2: Hemodynamic changes

Intubating Conditions

Achieved during direct laryngoscopy in both the groups - Regarding excellent intubation grade, patient in control group are having statistically significant better grading compared to study group, whereas acceptable grade of intubation are same in both groups. Most of the patients in 0.6 mg/kg dose graded good grade, had mild

diaphragmatic twitches, while one patient having poor grade had severe bucking on ETT. One patient from 1 mg/kg group also graded as poor, as he had poor jaw relaxation and laryngoscope cannot be put more than half length in mouth, so inj. rocuronium was given and then trachea was intubated

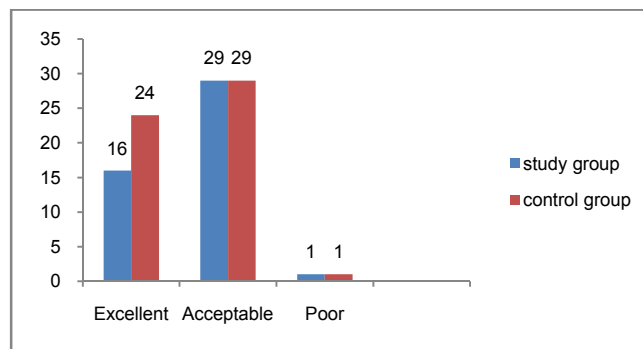


Figure 3: Intubating conditions in both groups

DISCUSSION

Muscle relaxant is used during intubation to facilitate intubation. The ideal muscle relaxant for intubation is the one which is having rapid onset of action, short duration of action and without any other side effects. Inj. Succinylcholine is having rapid onset and short duration among all available muscle relaxants. In the present study we compared the standard dose 1 mg/kg with lower dose i.e. 0.6 mg/kg with regard to the side effects. In our study we found, the duration of fasciculation's are comparable in both the groups. In contrast to this finding, McLaughlin C *et al*⁴ compared three doses of Succinylcholine and concluded that the severity of fasciculation were grater with 1.5 mg/kg dose than 0.5 or 3 mg/kg dose. In our study we found that hemodynamically both groups are comparable. Smita prakash *et al*⁹ also studied hemodynamic changes in 0.6 and 1 mg/kg dose and recorded that there are no statistically significant changes in both groups. our study results are similar to this study.

Mohd asim Rashid *et al*¹⁶ studied intubation conditions in females undergoing elective cesarean section, they studied three different doses of Succinylcholine and concluded that, the dose of 1.0 mg/kg produces excellent intubation conditions than 0.5 or 0.6 mg/kg dose. Our results are comparable with this study. McLaughlin, C *et al*⁴ studied 0.5, 1.5 and 3 mg/kg doses of Succinylcholine for intubating conditions, muscle damage and postoperative myalgia, they recommended that 3 mg/kg dose provided better combination of intubating conditions with minimal post operative myalgia. In contrast to our study, Smita prakash *et al*⁹, and Naguib *et al*¹¹ reported that 0.6 mg/kg dose produces comparable intubating conditions as 1 mg/kg dose, and suggested 1 mg/kg dose to be excessive for intubation purpose. Ellango *et al*¹⁷ compared 0.5 and 1 mg/kg Succinylcholine in pediatric patients for rapid sequence intubation, concluded that 0.5 mg /kg dose produces acceptable intubating condition as 1 mg/kg. In all the above studies^{9,11,17} they used fentanyl,

which is supposed to have muscle relaxing property, which may be the reason for their conclusion¹⁸.

CONCLUSION

From the present study it can be concluded that though acceptable intubating conditions are achieved in both the groups, for excellent intubating conditions 1 mg/kg dose is better than 0.6 mg dose. The dose of 0.6 mg/kg is not having any added advantage regarding duration of fasciculations and hemodynamic changes.

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